In the Specification:

Please substitute the following new paragraphs beginning on page 7, line 23 and ending on page 8, line 23:

The sectional view of Figure 1 illustrates the major components of a mass flow controller in accordance with the principles of the present invention. The mass flow controller 100 includes a thermal mass flow sensor assembly 102 and a valve assembly 104. The valve assembly 104 is connected to the mass flow controller housing 108 to control the rate of flow of gas in response to control signals generated by a mass flow sensor circuitry described generally in the discussion related to Figure 4. The mass flow controller 100 includes an inlet 106 for receiving a flow of gases to be metered. The process gas enters the mass flow controller though the inlet 106 and travels through the valve opening 110 to a bypass channel ~~121~~ 112. The valve 114 operates under control of the mass flow sensor and related circuitry to admit a precisely measured quantity of process gas into the inlet port 106, through the controller, and out the outlet port 116 for a processing application, such as may be employed in integrated circuit manufacturing. The bypass channel ~~121~~ 112 is connected to the inlet port 106 to receive and carry the stream of gas.

A laminar flow element 118 rests within the channel ~~121~~ 112 and provides a pressure drop across the thermal mass flow sensor 102 and drives a portion of the gas through the sensor tube 120 of the thermal mass flow sensor 102. The mass flow sensor includes circuitry that senses the rate of flow of gas through the controller 100 and controls operation of the valve assembly 104. The mass flow sensor assembly 102 is attached to a wall 122 of the mass flow controller that forms a boundary of the bypass channel ~~121~~ 112. Input and output apertures 124 and 126, respectively, in the wall 122 provide access to the mass flow sensor assembly 102 for a gas travelling through the mass flow controller 100. In this illustrative embodiment the mass flow sensor assembly 102 includes a base plate 128 for attachment to the wall 122. The base plate 128 may be attached to the wall and to the remainder of the sensor assembly using threaded hole and mating bolt combinations, for example. Input and output legs 130 and 132, respectively,

of the sensor tube 120 extend through respective input and output apertures of the base plate 128 and, through apertures 124 and 126 of the mass flow controller wall 122.

Please substitute the following new paragraphs beginning on page 10, line 24 and ending on page 11, line 16:

Figure 4 illustrates in greater detail an embodiment of a mass flow sensor in accordance with the principles of the present invention. The bypass tube ~~121~~112, laminar flow element 118, upstream resistive element 146 and downstream resistive element 144 are as previously described. The arrangement of the thermal clamp 141, including top 138 and bottom 140 portions, and its thermally conductive communication with the sensor tube 120 is illustrated in greater detail here. The sensor tube 120 is substantially surrounded and in conductive thermal contact with the thermal clamp 141 around its entire circumference at each end of its operational segment. The operational segment of the sensor tube is defined for illustrative purposes as that segment of the sensor tube disposed between the upstream 154 and downstream 156 legs of the thermal clamp.

One end 119 of the portion of the bypass tube ~~121~~112 that is coupled to the sensor tube defines an input and the other end of the portion of the bypass tube ~~121~~112 that is coupled to the sensor tube defines an output 123 so that in operation fluid flows from the input to the output portions in a downstream direction indicated by arrows shown in Figure 4. The laminar flow element 118 is disposed within the bypass tube for restricting the flow of fluid through the tube. An upstream end of the sensor tube couples to the bypass tube between the input end portion 119 and the laminar flow element 118. A downstream end of the sensor tube couples to the bypass tube between the laminar flow element 118 and the output portion 123. A fixed proportion of the total mass of fluid flowing from the input portion 119 to the output portion 123 flows through the sensor tube. The sensor tube may be of capillary dimensions and is fabricated from a material, such as steel, that is characterized by a relatively high thermal conductivity in comparison to the thermal conductivity of the fluid.

Please substitute the following new paragraphs beginning on page 12, line 10 and ending on page 12, line 23:

In operation, fluid flows from the input portion 119 of the bypass tube ~~121~~ 112 to the output portion 123 and a portion of the fluid flows through the restrictive laminar flow element 118. The remaining fluid flows through the sensor tube 120. The circuit (not shown) causes an electrical current to flow through the resistive elements 144 and 146 so that the resistive elements 144 and 146 generate and apply heat to the sensor tube 120 and, thereby, to the fluid flowing through the sensor tube 120. Because the upstream resistive element 144 transfers heat to the fluid before the fluid reaches the portion of the sensor tube 120 enclosed by the downstream resistive element 146, the fluid conducts more heat away from the upstream resistive element 144 than it does from the downstream resistive element 146. The difference in the amount of heat conducted away from the two resistive elements is proportional to the mass flow rate of fluid within the sensor tube and, by extension, the total mass flow rate through the mass flow rate controller from the input port through the output port. The circuit measures this difference by sensing the respective electrical resistances and generates an output signal that is representative of the mass flow rate through the sensor tube.